UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/522,510	03/10/2000	Youfeng Wu	884.258US1	5136

21186 7590 08/26/2004

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
WOOD, WILLIAM H	

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/522,510	Applicant(s) WU, YOUFENG
	Examiner William H. Wood	Art Unit 2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 3-35 are pending and have been examined.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by **Keller** et al. (USPN 5,355,487).

Claim 11

Keller disclosed a computer-implemented method comprising:

- periodically sampling a set of registers to obtain register values, wherein the register values are input values of a software program region *(column 9, lines 11-31; PID, SID and address; values in computers are stored in registers, and at least the profiler is a software program region)*;
- determining an occurrence frequency of the register values *(column 9, lines 11-31; profiling and incrementing count value in hash table)*;
- combining the register values into a single set-value *(column 9, lines 11-31; key to hash table is function of PID, SID and address)*; and

- storing the occurrence frequency and the single set-value in a data structure *(column 9, lines 11-31; accessing the hash table)*.

3. Claims 16-17 and 20-22 are rejected under 35 U.S.C. 102(a) as being anticipated by **Calder** et al., "Value Profiling and Optimization".

Claim 16

Calder disclosed a computer-implemented method comprising:

- identifying a candidate load instruction in a software program *(page 16, first sentence of section 6)*;
- instrumenting *(page 11, last paragraph)* the software program to, when executed sample a location-value every S occurrences of the candidate load instruction *(page 20, first full paragraph)*;
- storing an occurrence frequency of the location-values into a data structure *(page 16-23, section 6)*; and
- executing the software program *(page 11, section 4)*.

Claim 17

Calder disclosed the computer-implemented method of claim 16 wherein instrumenting comprises:

inserting instructions in the software program to count the number of times each location-value is sampled *(page 20, second full paragraph)*; and

inserting instructions in the software program to keep track of top location-values *(pages 5-11, section 3)*.

Claim 20

Calder disclosed the computer-implemented method of claim 17 wherein inserting instructions to keep track of top location-values includes inserting sampling instructions configured to profile the top N occurrences of location-values, where N is an integer *(pages 5-11, section 3)*.

Claims 21 and 22

The limitations of claims 21 and 22 correspond to claims 16 and 17 and thus are rejected in the same manner.

4. Claims 23 and 27 are rejected under 35 U.S.C. 102(a) as being anticipated by **Connors** et al., "Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results".

Claims 23

Connors disclosed a computer-implemented method comprising:

- selecting reuse regions within a software program *(page 164, section 4)*, the selecting including,

- profiling top (page 165, right column, third full paragraph) set-values for candidate reuse regions to produce a probability of top set-values *(page 158, section 1; and page 162-163, section 3.1; page 164, section 4.2; page 165, right column, third full paragraph, top k detections)*;
- storing an occurrence frequency of the <u>top set-values</u> into a data structure *(page 162-163, section 3.1; page 165, right column, third full paragraph)*; and

- selecting <u>the</u> reuse regions as a function of the probability of <u>the</u> set-values *(pages 164-166, section 4.2-4.4)*.

<u>Claim 27</u>

The limitations of claim 27 correspond to claim 23 and thus are rejected in the same manner.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3, 5-10, 12, 14-15, 30-31, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Connors** et al., "Compiler-Directed Dynamic Computation

Reuse: Rationale and Initial Results" in view of **Feller et al.**, "Value Profiling" and in further view of **Keller** et al. (USPN 5,355,487).

Claim 3

Connors disclosed a computer-implemented method *(page 158, abstract)* comprising:

- identifying a candidate reuse region of a software program *(page 164, section 4)*;
- determining an input set for the candidate reuse region, wherein the input set comprises a plurality of input registers for storing input values of the candidate reuse region *(page 162-163, section 3.1)*;
- to, when executed, profile set-values for the input set *(page 159, left column, first full paragraph)*, wherein each set-value comprises an input register value for each of the plurality of input registers *(page 162-163, section 3.1)*;
- executing the instrumented software, wherein the executing includes tracking a number of times a set-value is encountered *(page 158, abstract; page 162-163, section 3.1)*.

Connors did not explicitly state *instrumenting.* **Feller** demonstrated that it was known at the time of invention to utilize instrumentation for profiling (page 262, left column, last paragraph). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the profiling system of **Connors** with instrumentation as found in **Feller**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to make use of common (and therefore easily

used) tool/method for gathering profiles of a system (additionally, **Connors** explicitly points to using **Feller**'s techniques; page 159, first full paragraph, left column).

Connors did not state *for each set-value, combining each of the input register values into a single value*. In the analogous profiling art, **Keller**, it was demonstrated that it was known at the time of invention to utilize combining values into a single value (column 9, lines 11-31; "The key to the table is a functions of …"). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the profiling system of **Connors** with combining register values into a single value as suggested by **Keller**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to store profile information about the reuse regions of code in an efficient use of memory (**Keller**: column 9, lines 13-17; using a key or "single value" to access a hash table of profiled heuristics).

Claim 5

Connors, **Feller** and **Keller** disclosed the computer-implemented method of claim 3 wherein instrumenting comprises inserting instructions to periodically sample set-values *(as above for claim 1)*.

Claim 6

Connors, **Feller** and **Keller** disclosed the computer-implemented method of claim 5 wherein the input-set comprises a plurality of input registers, and each set-value

comprises an input register value for each of the plurality of input registers *(as above under claim 1)*, and wherein instrumenting further comprises:

- inserting instructions <u>into the software program which, when executed, will</u> combine each of the input register values into a single value *(as above under claim 1)*; and
- inserting instructions <u>into the software program which, when executed, will</u> index into a data structure of profile indicators using the single value *(**Keller**: column 9, lines 17-20)*.

<u>*Claim 7*</u>

Connors, **Feller** and **Keller** disclosed the computer-implemented method of claim 5 wherein instrumenting further comprises:

- inserting instructions to profile the top N occurring set-values *(**Connors**: page 159, left column, last full paragraph; page 165, right column , third full paragraph, top k; **Feller**: page 262, left column, last paragraph)*, where N is chosen as a function of an expected number of reuse instances *(**Feller**: page 259, left column, last paragraph)*.

<u>*Claim 8*</u>

Connors, **Feller** and **Keller** disclosed the computer-implemented method of claim 3 further comprising selecting the candidate reuse region as a computation reuse region *(**Connors**: page 165, section 4.3)*.

Claims 9 and 10

The limitations of claims 9 and 10 correspond to claims 3 and 5 and thus are rejected in the same manner.

Claim 12

Keller did not explicitly state the computer-implemented method of claim 11 wherein periodically sampling comprises:

- sampling a plurality of registers to obtain a set-value every S occurrences of a candidate reuse region, where S is a sampling period.

Connors demonstrated that it was known at the time of invention to profile set-values for candidate reuse regions (page 162-163, section 3.1; page 164, section 4). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the analogous prior art profiling system of **Keller** with reuse regions as found in **Connors**' teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to aiding software and processor performance through the reuse of computation results (**Connors**: page 158, left column, section 1).

Feller demonstrated that it was known at the time of invention to sample based on a sampling period during profiling (page 266-267, section 7). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the profiling

system of **Keller** and **Connors** with periodic sampling as found in **Feller**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to only profiling as long as necessary (**Feller**: page 267, left column, first full paragraph).

Claim 14

Keller, **Connors** and **Feller** disclosed the computer-implemented method of claim 12 wherein storing comprises:

- accessing a record in the data structure as a function of the set-value *(**Keller**: column 9, lines 11-31; "The key to the table is a functions of ...");* and
- incrementing a profile indicator at the record *(**Connors**: alters the record accordingly or else would be useless).*

Claim 15

Keller, **Connors** and **Feller** disclosed the computer-implemented method of claim 12:

[i)] wherein periodically sampling further comprises sampling set-values in the plurality of registers at the beginning of a candidate reuse region *(**Connors**: page 165-166, sections 4.3 and 4.4; Connors describes determining the entry points into the reuse region and needing to profile them)*

[ii)] the plurality of registers being input registers to the candidate reuse region *(**Connors**: page 162, first paragraph in section 3.1)*

Claims 30-31

The limitations of claims 30-31 correspond to claims 3 and 5 and thus are rejected in the same manner.

Claim 33

The limitations of claim 33 correspond to claims 11 and 12 and thus are rejected in the same manner. Additionally, **Connors** disclosed top set-values (page 165, right column, third full paragraph) and **Feller** disclosed top set-values (page 259, right column, second paragraph).

Claim 35

The limitations of claim 35 correspond to claim 14 and thus are rejected in the same manner.

7. Claims 4 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Connors** et al., "Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results" in view of **Feller et al.**, "Value Profiling" and in further view of **Keller** et al. (USPN 5,355,487) an in further view of "Dictionary of **Computing**".

Claim 4

Connors, **Feller** and **Keller** did not explicitly state the computer-implemented method of claim 3 wherein combining comprises:

- folding each of the input register values to create folded values; and
- concatenating the folded values.

Computing demonstrated that it was known at the time of invention to utilize folding and hashing using a key value (page 196 and 221; *folding* and *hashing*). It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Connors**', **Feller**'s and **Keller**'s system with folding and hashing as found in **Computing**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to use simple direct and quick methods to access information.

Claims 32

The limitations of claim 32 correspond to claim 4 and thus are rejected in the same manner. An exclusive-or operation relates to claim 4's folding and concatenating.

8. Claims 13 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Connors** et al., "Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results" in view of **Feller et al.**, "Value Profiling" and in further view of **Keller** et al. (USPN 5,355,487) as applied to claim 12 and in further view of **Chang** (USPN 5,933,628).

Claim 13

Keller, **Connors** and **Feller** did not explicitly state the computer-implemented method of claim 12 further comprising:

> i) *identifying a group of control equivalent candidate region entries and candidate load instructions*
>
> ii) *inserting instructions prior to the group, wherein the instructions set a predicate register every S occurrences*
>
> iii) *inserting profiling instructions at each of the control equivalent candidate region entries and candidate load instructions, wherein the profiling instructions are predicated on the predicate register*

Chang demonstrated that it was known at the time of invention to use predicate registers for decision control as in item iii) (**Chang**: column 5, line 52 to column 6, line 18). It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Keller**, **Connors** and **Feller**'s sampling and profiling of reuse regions system with predicate registers utilized by code as found in **Chang**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to reduce the amount of branches in the code and thus speed up and lineate the whole operation. Official Notice is taken that it was known at the time of invention to instrument code as little as possible and hence use a small section of instrumentation code for multiple regions of the to be observed code, where possible as in item i) and ii). Thus, It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Keller**, **Connors** and **Feller**'s sampling and profiling of reuse regions system with functionality to insert small amounts of instrumentation

code which could observe several regions of the observable code. This implementation would have been obvious because one of ordinary skill in the art would be motivated to reduce the amount of damaging additional instrumentation code, and thus improve the efficiency of the profiling operation by allowing the overall code to behave as closely as possible to the original uninstrumented code. S occurrences is met in the same way as in claim 12.

Claim 34

The limitations of claim 34 correspond to claim 13 and thus are rejected in the same manner.

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Calder** et al., "Value Profiling and Optimization" in view of **Chang** (USPN 5,933,628).

Claim 18

Calder did not explicitly state the computer-implemented method of claim 16 further comprising:

i) *identifying a group of control equivalent candidate region entries and candidate load instructions in the software program*

ii) *inserting instructions in the software program prior to the group, wherein the instructions set a predicate register every S occurrences*

iii) *inserting profiling instructions* *<u>in the software program</u>* *at each of the control equivalent candidate region entries and candidate load instructions, wherein the profiling instructions are predicated on the predicate register*

Chang demonstrated that it was known at the time of invention to use predicate registers for decision control (**Chang**: column 5, line 52 to column 6, line 18). It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Calder**'s sampling and profiling of reuse regions system with predicate registers utilized by code as found in **Chang**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to reduce the amount of branches in the code and thus speed up and lineate the whole operation. Official Notice is taken that it was known at the time of invention to instrument code as little as possible and hence use a small section of instrumentation code for multiple regions of the to be observed code, where possible as in item i) and ii). Thus, It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Calder**'s sampling and profiling of reuse regions system with functionality to insert small amounts of instrumentation code which could observe several regions of the observable code. This implementation would have been obvious because one of ordinary skill in the art would be motivated to reduce the amount of damaging additional instrumentation code, and thus improve the efficiency of the profiling operation by allowing the overall code to behave as closely as possible to the original uninstrumented code. S occurrences is met in the same way as in claim 12.

Claim 19

Calder disclosed the computer-implemented method of claim 17 *wherein the candidate region includes a plurality of candidate load instructions* (as above). **Calder** did not explicitly state *each of the plurality of load instructions being predicted on a common predicate register*. **Chang** demonstrated that it was known at the time of invention to use predicate registers for decision control (**Chang**: column 5, line 52 to column 6, line 18). It would have been obvious to one of ordinary skill in the art at the time of invention to implement **Calder**'s sampling and profiling of reuse regions system with predicate registers utilized by code as found in **Chang**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to reduce the amount of branches in the code and thus speed up and lineate the whole operation.

10. Claims 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Connors** et al., "Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results" in view of **Keller** et al. (USPN 5,355,487).

Claim 24

Connors did not explicitly state the computer-implemented method of claim 23 wherein profiling <u>top</u> set-values comprises:

- representing each top set-value as a single value; and
- accessing a data structure as a function of the single value to modify a profile indicator.

In the analogous profiling art, **Keller**, it was demonstrated that it was known at the time of invention to utilize combining values into a single value (column 9, lines 11-31; "The key to the table is a functions of ..."). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the profiling system of **Connors** with combining register values into a single value as suggested by **Keller**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to store profile information about the reuse regions of code in an efficient use of memory (**Keller**: column 9, lines 13-17; using a key or "single value" to access a hash table of profiled heuristics).

Claim 25

Connors and **Keller** disclosed the computer-implemented method of claim 24, wherein accessing a data structure comprises accessing a data structure at least as large as a number of expected reuse instances *(**Connors**: page 162-163, section 3.1).*

Claim 26

Connors and **Keller** disclosed the computer-implemented method of claim 25 wherein selecting comprises marking as reuse regions those candidate reuse regions having a finite number of top set-values that have a probability of occurrence greater than a threshold *(**Connors**: page 165, right column, third full paragraph, top k account for a large fraction).*

Claim 28

The limitations of claim 28 correspond to claim 24 and thus are rejected in the same manner.

11. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Connors** et al., "Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results" in view of **Feller et al.**, "Value Profiling".

Claim 29

Connors did not explicitly state the machine-readable medium of claim 27 further comprising:

- identifying a candidate load instruction within the candidate reuse region *(**Connors**: page 165, right column , third full paragraph)*; and
- to profile location-values for the candidate load instruction *(**Connors**: page 165, right column , third full paragraph)*.

Connors did not explicitly state *instrumenting*. **Feller** demonstrated that it was known at the time of invention to utilize instrumentation for profiling (page 262, left column, last paragraph). It would have been obvious to one of ordinary skill in the art at the time of invention to implement the profiling system of **Connors** with instrumentation as found in **Feller**'s teaching. This implementation would have been obvious because one of ordinary skill in the art would be motivated to make use of common (and therefore easily

used) tool/method for gathering profiles of a system (additionally, **Connors** explicitly points to using **Feller**'s techniques; page 159, first full paragraph, left column).

Response to Arguments

12. Applicant's arguments filed 14 May 2004 have been fully considered but they are not persuasive. Applicant argued: 1) **Keller** did not disclose register values that are input values of a software region or explicitly register values themselves; 2) **Calder** did not disclose instrumenting the software to profile, while executing; 3) **Calder** failed to teach sampling a location-value every S occurrences of the candidate load instruction; 4) **Calder** failed to disclose inserting instructions in the software program to count a number of times the location-value is sampled; 5) **Connors**, in relation to claim 23, failed to disclose "selecting including, ... storing an occurrence frequently of the top set-values into a data structure"; and 6) **Connors** would not have combined input register values.

First, the rejection of claim 11 was adjusted as necessitated by the amendment to the claim's limitations.

Second, Applicant is referred to **Calder** page 1, Introduction section, "This paper examines using profile *feedback* information to identify which variables have invariant/semi-invariant behavior". **Calder** instruments code with instructions (this is then compiled), which during run-time provide profile information. This information can later be used in compiling or optimizing the original code. This is consistent with the previously cited passages of page 11. Furthermore, the broadest reasonable interpretation of Applicant's invention read upon this.

Third, Applicant's claim language is sufficiently broad to read upon **Calder**. "Sampling every S occurrences" reads upon "sampling every 1 occurrence". In other words recording for all candidates. Further, "location value" seems to be nothing more than an address. The cited portions of **Calder** (including page 20, first full paragraph) are clearly read upon by such language. **Calder** samples (profiling) the number of times memory locations (addresses) are accessed.

Fourth, Applicant is referred to **Calder** page 11, last paragraph, "instrumentation tool", where instructions are inserted. Profiling location-values is discussed on page 20.

Fifth, the portions of **Connors** Applicant choose to cite are taken out of context. Section 3.1 on page 162 refers to using a structure for recording values to help in *selecting* regions, which will be reused based upon those values. Any processing that may or may not be done by the compiler before is not the actual *selecting* of the reuse regions (that is appropriately repetitive inputs as to be reusable). Furthermore, claim 23 is far too broad to specify any ordering of events (including whether compiler or run-time).

Sixth, the portion of **Connors** which Applicant cited, "at compile time, the mapping relation between the single input register and single output register may be determined", does not have any effect on **Connors'** (and the other cited prior art) ability to combine or not combine multiple values into one. Upon further analysis of the reference, it is immediately clear the passage refers to a specific example (see page 160, left column, section "Block-level resuse"; "Figure 2 represents <u>an example</u> from the SPEC92 .... The dependence graph illustrates that the entire sequence of operations is

dependent on a single input register r3 and defines a single output register r26"). The rejection is based upon **Connors** as a whole and in particular the previously cited portions, which clearly indicate multiple register inputs into a block of code. Combining into a single value was discussed previously as well, along with motivation. The combination is proper and disclosed Applicant's claimed invention.

All of Applicant's raised issues have been discussed in relation to specific claims. Similar arguments regarding similar claims are addressed in the same manner. Thus, the rejections under 35 U.S.C. § 102 and 103 are maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Wood whose telephone number is (703)305-3305. The examiner can normally be reached 7:30am - 5:00pm Monday thru Thursday and 7:30am - 4:00pm every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703)305-9662. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-7239 for regular communications and (703)746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

William H. Wood
August 16, 2004

TODD INGBERG
PRIMARY EXAMINER